4.0 COLLISION TRENDS

In evaluating collision data, it is important to review historical trends. This section discusses collision trends over the past ten years. Data is addressed in terms of number of collisions and is also normalized to account for changes in population and roadway use within unincorporated King County. Trends in pedestrian, bicycle, and motorcycle collisions are also discussed.

4.1. Overall Trends

A total of 2,692 collisions were reported in unincorporated King County in 2003.

It is necessary to account for external factors when comparing 2003 collisions with data from previous years. To allow direct comparison, the data is "normalized" using the estimated accident rate. The estimated accident rate (accidents per million vehicle miles) has fluctuated, varying between 1.10 and 1.54, with little evident trend.

Review of collision trends indicates the following additional changes over the past ten years:

- Annual collisions have decreased by 41%.
- The estimated annual societal cost of these collisions has decreased by 49%.
- Pedestrian and bicycle collisions have decreased by 43% and 66%, respectively.
- Pedestrian and bicycle collision rates (collisions per 10,000 people) have decreased by 17% and 51%, respectively.
- Motorcycle collisions have decreased by 10% over the past ten years, but have increased by 44% since 1999.

With the exception of the estimated accident rate, a decreasing trend is apparent in all of these measures.

4.2. Ten Year Collision History

Table 1 summarizes the number of collisions occurring annually over the past 10 years. The collisions are broken down by severity into property damage only (PDO), injury, and fatal accidents.

As indicated in Table 1, the number of collisions has decreased over the last ten years, with a reduction of 41% for total collisions and similar reductions for PDO and injury accidents. A steady decline occurred from 1994 through 2000. PDO and total collisions have increased slightly between 2000 and 2003, while injury accidents decreased during this time period.

The annual number of fatal collisions varied between 14 and 27 during the ten-year period. Due to the relatively low number of fatal collisions, evaluation of trends over time would not yield statistically significant results. However, fatalities as a percentage of total collisions have been relatively consistent, ranging between approximately ½ to 1%.

TABLE 2 TEN-YEAR COLLISION HISTORY				
Year	PDO	Injury	Fatal	Total
1994	2545	1954	27	4526
1995	2277	1839	20	4136
1996	2119	1608	20	3747
1997	1697	1310	25	3032
1998	1665	1191	17	2873
1999	1513	1101	17	2631
2000	1365	1043	25	2433
2001	1403	986	27	2416
2002	1571	982	16	2569
2003	1707	971	14	2692
Total	17862	12985	208	31055
Note: Data is not normalized to account for external factors. Normalized data is considered more appropriate when comparing collisions over time.				

4.3. Ten Year Societal Cost

Figure 1 shows the estimated annual cost of collisions over the past 10 years. As indicated, the estimated cost of collisions during 2003 was $87 million[3].

Figure 1
Estimated Annual Collision Costs

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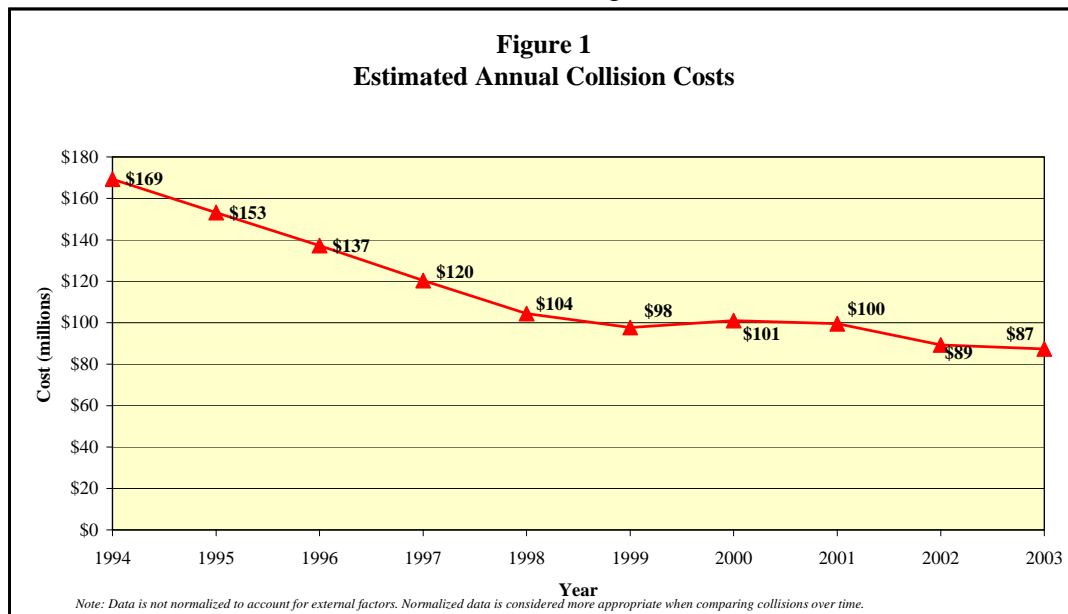
[3] The following estimated costs per accident are used in this calculation: Property Damage Only-$6,000, Injury-$65,000, Fatality-$1,000,000

The cost attributed to collisions has decreased steadily, with a 48% reduction over the ten-year period. It is worth noting that while the number of collisions increased between 2000 and 2003, the cost of these collisions decreased. This is due to a decrease in the severity of the collisions, while PDO accidents increased, the number of injury accidents and fatalities decreased.

4.4. <u>Ten Year Estimated Accident Rate</u>

The accident rate is frequently used to account for differences in traffic volumes when comparing the number of accidents at different locations or during different time periods. The accident rate is commonly expressed in accidents per million vehicle miles (acc/mvm).

The accident rate is obtained by dividing the number of accidents during a given time period by the number of miles driven during the same time period. Miles driven is determined by multiplying the length of the road by the number of vehicles traveling on the road. This is a fairly straightforward process for an individual roadway. For more complex street networks, the number of miles driven is estimated since traffic volumes are not available for all roads. Further information on determining accident rates is provided in Appendix B.

The estimated accident rate over the past 10 years is shown in Figure 2. The information used in this estimate is provided in Table C3 (Appendix C).

Figure 2
Estimated Accident Rate
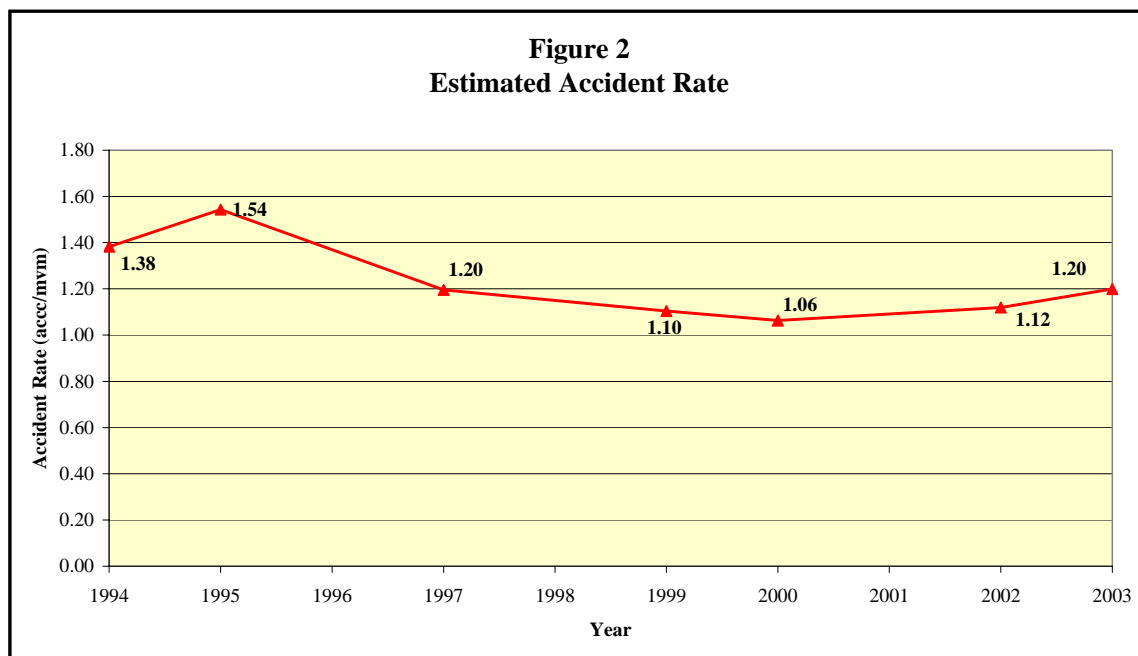
Review of Figure 2 indicates that the estimated accident rate has varied between 1.10 and 1.54 acc/mvm during the last 10 years. No definitive trend is evident.

It should be noted that due to limited data, a number of assumptions were made in estimating the accident rate. While the estimated accident rate is useful to compare changes over time within unincorporated King County, it is not valid as a basis for comparison with accident rates for individual roadways or from other jurisdictions.

4.5. Ten Year Pedestrian and Bicycle Collision History

Figures 3 and 4 show the number of pedestrian and bicycle collisions occurring annually over the past 10 years. The collisions are broken down by severity into property damage only (PDO), injury, and fatal accidents.

Figure 3
Pedestrian Collision History

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Fatal	8	6	2	2	6	1	3	2	1	1
Injury	60	57	54	51	49	30	31	35	38	37
PDO	0	0	0	0	0	0	0	0	0	1

Year

Note: Data is not normalized to account for external factors. Normalized data is considered more appropriate when comparing collisions over time.

Figure 4
Bicycle Collision History

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
■ Fatal	2	0	0	3	1	0	2	0	0	0
■ Injury	66	74	63	42	34	34	29	19	34	23
■ PDO	2	0	1	1	2	0	0	0	1	3

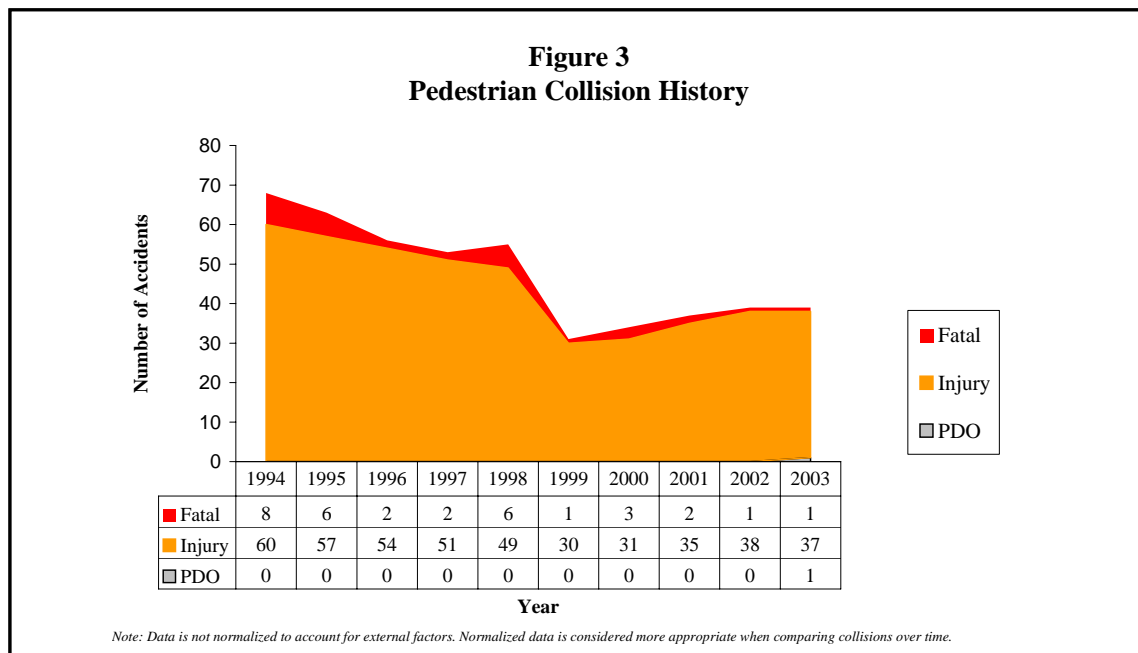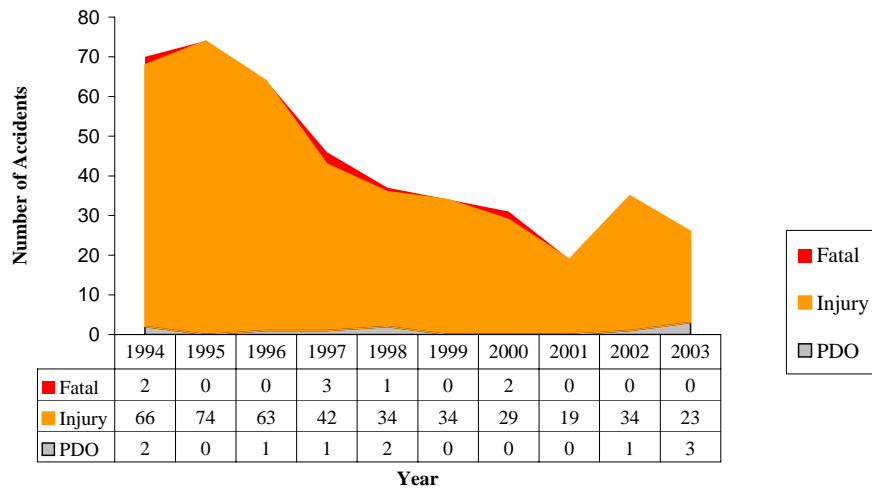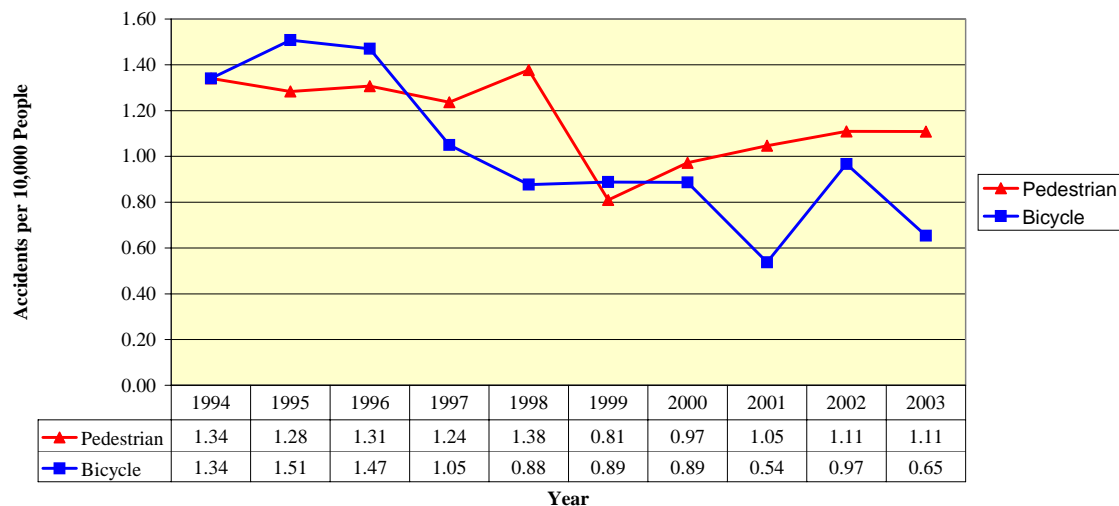**Year**

Note: Data is not normalized to account for external factors. Normalized data is considered more appropriate when comparing collisions over time.

As indicated in these figures, pedestrian and bicycle collisions have decreased by 43% and 66%, respectively.
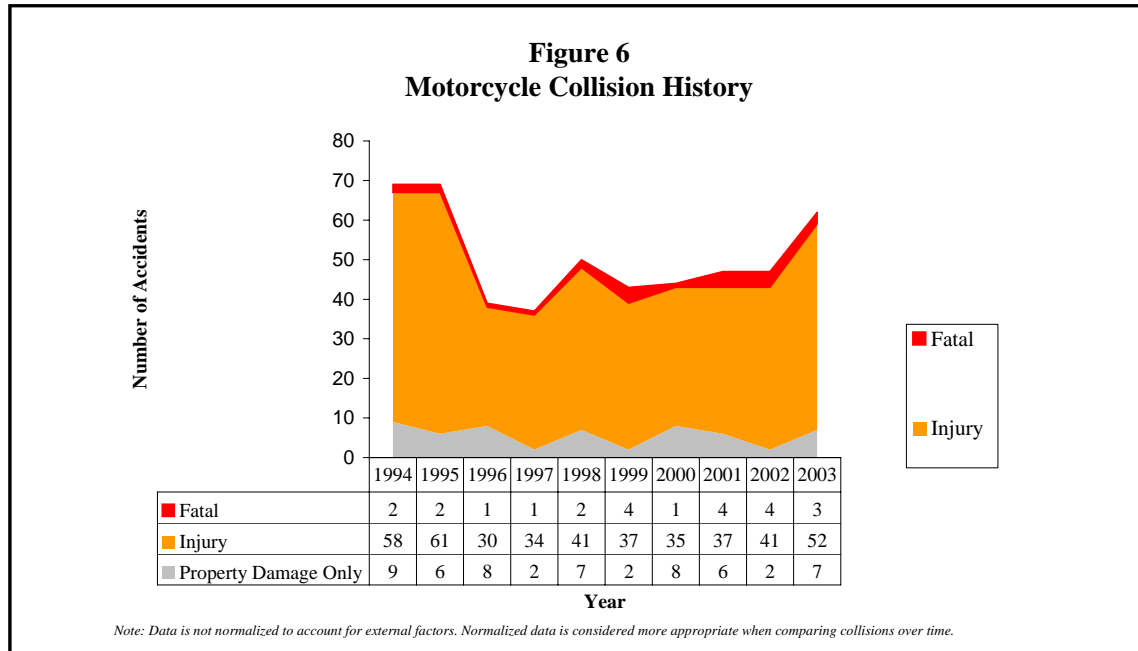
Figure 5 shows pedestrian and bicycle collisions per 10,000 residents of unincorporated King County. The pedestrian and bicycle collision rates have decreased by 17% and 51%, respectively.

Figure 5
Pedestrian and Bicycle Collisons per 10,000 Population

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
▲ Pedestrian	1.34	1.28	1.31	1.24	1.38	0.81	0.97	1.05	1.11	1.11
■ Bicycle	1.34	1.51	1.47	1.05	0.88	0.89	0.89	0.54	0.97	0.65

Year

4.6. Ten Year Motorcycle Collision History

The ten-year motorcycle collision history is illustrated in Figure 6. The number of motorcycle collisions decreased by nearly 50% in 1996, fluctuated between 1996 and 1999, and then increased every year since that time. Motorcycle collisions have decreased by 10% over the past ten years, but have increased by 44% since 1999.

Figure 6
Motorcycle Collision History

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
■ Fatal	2	2	1	1	2	4	1	4	4	3
■ Injury	58	61	30	34	41	37	35	37	41	52
■ Property Damage Only	9	6	8	2	7	2	8	6	2	7

Year

Note: Data is not normalized to account for external factors. Normalized data is considered more appropriate when comparing collisions over time.

Motorcycle collisions tend to be more severe than accidents involving larger vehicles. Nearly 90% of the motorcycle collisions resulted in injuries or fatalities.

While the number of miles driven by motorcycles is not available, information on the number of registered motorcycles is available from the Washington State Department of Licensing[4]. Approximately 5% of licensed drivers in King County also have motorcycle licenses, and approximately 1% of the registered motor vehicles in King County are motorcycles. Both the number of registered motor vehicles and motorcycles in King County has increased by approximately 25% over the past ten years.

It should be noted that due to the relatively low number of motorcycle collisions, the recent increase would not generally be considered a statistically valid trend. However, considering this increase and the severity of motorcycle collisions, further endeavors in this area may be warranted.

Motorcycle collisions are discussed further in section 5.10.

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[4] Department of Licensing figures include both incorporated cities and unincorporated King County